



GSA CATALOG

Power Systems Engineering Support Supplement No. IV January 16, 2004

General Services Administration

Federal Supply Service

Authorized Federal Schedule Price List

SCHEDULE: 56
Buildings and Building
Materials/Industrial
Services and Supplies

FS GROUP: FSC Group 61
Power Distribution
Equipment, Generators,
and Batteries

SIN: 412-52
Power Systems Engineering
Support

CONTRACT NO: GS-07F-0144J

PERIOD: January 13, 2004 through
January 31, 2009

CONTRACTOR: **NV Enterprises, Inc.**
11491 Sunset Hills Road
Suite 320
Reston, VA 20190
(703) 742-8620
(703) 742-8621
TIN # 54-1507634
DUNS# 78-413-9206
CAGE# 1KRS0
nve@nve-inc.com

BUSINESS SIZE: 8(a) Small Disadvantage
Business

Contractor Information for Ordering Activities

1. Special Item Number: 412-52 Power Systems Engineering Support
includes Program management, engineering, technical, data management and administration support. Excludes personal services.

Lowest Price Model: Word Processor @ \$31.18
2. Maximum Order: \$200,000
3. Minimum Order: \$100
4. Geographic Coverage 48 Contiguous States, Alaska, Hawaii, Puerto Rico and Washington, D.C.
5. Point(S) Of Production Washington DC Metropolitan Area, USA
6. Discount 7%-22.077% Discounts
7. Quantity Discounts Additional discounts may be negotiated with the ordering activity for orders exceeding the maximum order, \$200,000
8. Prompt Payment Terms Net 30 days
9. Government Credit Card Yes
10. Foreign Items None
11. Time Of Delivery: Contract
12. F.O.B. Points Destination (within 48 Contiguous States, Alaska, Hawaii, Puerto Rico and Washington, D.C.)
13. Ordering And Payment Addresses **NV Enterprises, Inc.**
11491 Sunset Hills Road
Suite 320
Reston, VA 20190
(703) 742-8620
(703) 742-8621
14. Payment Address(Es). **NV Enterprises, Inc.**
11491 Sunset Hills Road
Suite 320
Reston, VA 20190
(703) 742-8620
(703) 742-8621

15. Warranty Provision

G-FSS-920 ORDERING PROCEDURES FOR SERVICES (REQUIRING A STATEMENT OF WORK) (MAR 2003)

FAR 8.402 contemplates that GSA may occasionally find it necessary to establish special ordering procedures for individual Federal Supply Schedules or for some Special Item Numbers (SINs) within a Schedule. GSA has established special ordering procedures for services that require a Statement of Work. These special ordering procedures take precedence over the procedures in FAR 8.404 (b)(2) through (b)(3).

When ordering services over \$100,000, Department of Defense (DOD) ordering offices and non-DOD agencies placing orders on behalf of DOD must follow the policies and procedures in the Defense Federal Acquisition Regulation Supplement (DFARS) 208.404-70 -- Additional ordering procedures for services. When DFARS 208.404-70 is applicable and there is a conflict between the ordering procedures contained in this clause and the additional ordering procedures for services in DFARS 208.404-70, the DFARS procedures take precedence.

GSA has determined that the prices for services contained in the contractor's price list applicable to this Schedule are fair and reasonable. However, the ordering office using this contract is responsible for considering the level of effort and mix of labor proposed to perform a specific task being ordered and for making a determination that the total firm-fixed price or ceiling price is fair and reasonable.

(a) When ordering services, ordering offices shall-

(1) Prepare a Request (Request for Quote or other communication tool):

(i) A statement of work (a performance-based statement of work is preferred) that outlines, at a minimum, the work to be performed, location of work, period of performance, deliverable schedule, applicable standards, acceptance criteria, and any special requirements (i.e., security clearances, travel, special knowledge, etc.) should be prepared.

(ii) The request should include the statement of work and request the contractors to submit either a firm-fixed price or a ceiling price to provide the services outlined in the statement of work. A firm-fixed price order shall be requested, unless the ordering office makes a determination that it is not possible at the time of placing the order to estimate accurately the extent or duration of the work or to anticipate cost with any reasonable degree of confidence. When such a determination is made, a labor hour or time-and-materials quote may be requested. The firm-fixed price shall be based on the prices in the schedule contract and shall consider the mix of labor categories and level of effort required to perform the services described in the statement of work. The firm-fixed price of the order should also include any travel costs or other direct charges related to performance of the services ordered, unless the order provides for reimbursement of travel costs at the rates provided in the Federal Travel or Joint Travel Regulations. A ceiling price must be established for labor-hour and time-and-materials orders.

(iii) The request may ask the contractors, if necessary or appropriate, to submit a project plan for performing the task, and information on the contractor's experience and/or past performance performing similar tasks.

(iv) The request shall notify the contractors what basis will be used for selecting the contractor to receive the order. The notice shall include the basis for determining whether the contractors are technically qualified and provide an explanation regarding the intended use of any experience and/or past performance information in determining technical qualification of responses.

(2) Transmit the Request to Contractors:

Based upon an initial evaluation of catalogs and price lists, the ordering office should identify the contractors that appear to offer the best value (considering the scope of services offered, pricing and other factors such as contractors' locations, as appropriate) and transmit the request as follows:

(i) The request shall be provided to at least three (3) contractors if the proposed order is estimated to exceed the micro-purchase threshold, but not exceed the maximum order threshold.

15. Warranty Provision (con't)

(ii) For proposed orders exceeding the maximum order threshold, the request shall be provided to an appropriate number of additional contractors that offer services that will meet the agency's needs.

(iii) In addition, the request shall be provided to any contractor who specifically requests a copy of the request for the proposed order.

(iv) Ordering offices should strive to minimize the contractors' costs associated with responding to requests for quotes for specific orders. Requests should be tailored to the minimum level necessary for adequate evaluation and selection for order placement. Oral presentations should be considered, when possible.

(3) Evaluate Responses and Select the Contractor to Receive the Order:

After responses have been evaluated against the factors identified in the request, the order should be placed with the schedule contractor that represents the best value. (See FAR 8.404)

(b) The establishment of Federal Supply Schedule Blanket Purchase Agreements (BPAs) for recurring services is permitted when the procedures outlined herein are followed. All BPAs for services must define the services that may be ordered under the BPA, along with delivery or performance time frames, billing procedures, etc. The potential volume of orders under BPAs, regardless of the size of individual orders, may offer the ordering office the opportunity to secure volume discounts. When establishing BPAs ordering offices shall—

(1) Inform contractors in the request (based on the agency's requirement) if a single BPA or multiple BPAs will be established, and indicate the basis that will be used for selecting the contractors to be awarded the BPAs.

(i) SINGLE BPA: Generally, a single BPA should be established when the ordering office can define the tasks to be ordered under the BPA and establish a firm-fixed price or ceiling price for individual tasks or services to be ordered. When this occurs, authorized users may place the order directly under the established BPA when the need for service arises. The schedule contractor that represents the best value should be awarded the BPA. (See FAR 8.404)

(ii) MULTIPLE BPAs: When the ordering office determines multiple BPAs are needed to meet its requirements, the ordering office should determine which contractors can meet any technical qualifications before establishing the BPAs. When establishing multiple BPAs, the procedures in (a)(2) above must be followed. The procedures at (a)(2) do not apply to orders issued under multiple BPAs. Authorized users must transmit the request for quote for an order to all BPA holders and then place the order with the BPA holder that represents the best value.

(2) Review BPAs Periodically: Such reviews shall be conducted at least annually. The purpose of the review is to determine whether the BPA still represents the best value. (See FAR 8.404)

(c) The ordering office should give preference to small business concerns when two or more contractors can provide the services at the same firm-fixed price or ceiling price.

(d) When the ordering office's requirement involves both products as well as executive, administrative and/or professional, services, the ordering office should total the prices for the products and the firm-fixed price for the services and select the contractor that represents the best value. (See FAR 8.404)

(e) The ordering office, at a minimum, should document orders by identifying the contractor from which the services were purchased, the services purchased, and the amount paid. If other than a firm-fixed price order is placed, such documentation should include the basis for the determination to use a labor-hour or time-and-materials order. For agency requirements in excess of the micro-purchase threshold, the order file should document the evaluation of Schedule contractors' quotes that formed the basis for the selection of the contractor that received the order and the rationale for any trade-offs made in making the selection.

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| 16. Export Packing Charges | Not Applicable |
| 17. Terms and Conditions of Government purchase card acceptance | Government Purchase Card is accepted. |
| 18. Terms and conditions of rental, maintenance, and repair. | Not Applicable |
| 19. Terms and conditions of installation. | Not Applicable |
| 20. Terms and conditions of repair parts indicating date of parts lists and any discounts from list prices | Not Applicable |
| 20a. Terms and conditions of Other Services. | SPECIAL ITEM NUMBER 412-52
POWER SYSTEMS ENGINEERING SUPPORT |

(1) Power systems engineering support includes: Program management, engineering, technical, data management and administration support. Excludes personal services.

(2) Tasks ordered under this special item number may include the following:

Technical, engineering, and management support; State of the art engineering analysis tools and concepts that integrate electrical power and other environmental systems design; Engineering environmental and power systems support in conducting reports, studies, and assessments; Validate system performance and reliability objectives; Engineering required for integration of new technologies in existing power and environmental systems configurations; Analysis and studies that enhance future planning and expansion of facilities by making critical system data readily available for contingency studies and evaluations; Preparation of revised and/or new power and environmental systems documents as required (i.e. orders, technical manuals, directives); Investigation, cost versus benefit analysis, and recommendations for new power and environmental systems and modifications to existing systems; Evaluation of program and incorporation of improved program management, tracking, control and cost control methods; Review of budget submissions and recommendations for improvements in data collection and cost control areas; Participate and/or conduct engineering workshops/seminars; Risk assessment and prioritizing projects and alternatives; Develop a program management plan to address all elements of an environmental and power system program; Support development of original cost, effective designs, cost estimates, project implementation plans, detailed specifications, drawings, standards, procedures, quality control techniques, and equipment modification and modernization to improve the reliability, maintainability, safety, and continuity of service of facilities and equipment; Engineering studies of problems that have impact on system performance and service continuity; Development and review of maintenance standards and manufacturers instruction books. Support the coordination and inclusion of technical material into the maintenance system; Develop and provide program briefing materials and reports; Conduct an industry survey to ascertain the state-of-the-art environmental and power system design and analysis tools, methods, and procedures; and Related tasks.

(3) Prime contractors may subcontract services ordered under this Special Item Number unless specifically prohibited by the contracting officer issuing the delivery order against the Multiple Award Schedule contract. The prime contractor shall be responsible, accountable, and liable for all work performed by any subcontractor, at any level or tier.

(4) Past Performance – In order to assist the Government in assessing an offeror's past performance, each company responding to this solicitation will be required to have Dun and Bradstreet (D&B) complete a Past Performance Evaluation Report on that firm. The request to D&B must be made prior to submission of a proposal. Each offeror must submit, with its proposal, a completed copy of the past performance evaluation form sent by the offeror to Dun and Bradstreet. Any charges associated with the Past Performance Evaluation Report will be paid by the offeror.

Reference Clause G-FSS-920, Ordering Procedures for Services (Requiring a Statement of Work), found in the basic solicitation.

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|--|----------------|
| 21. List of service and distribution points (if applicable) | Not Applicable |
| 22. List of participating dealers (if applicable) | Not Applicable |
| 23. Preventive maintenance (if applicable). | Not Applicable |
| 24. Environmental attributes, e.g. recycled content, energy efficiency, and/or reduced pollutants. | Not Applicable |
| 25. Data Universal Number System (DUNS) number. | 78-413-9206 |
| 26. Notification regarding registration in Central Contractor Registration (CCR). database. | 1 KRS0 |

NV ENTERPRISES, INC.
AUTHORIZED FEDERAL SCHEDULE PRICE LIST
SIN 412-52 POWER SYSTEMS ENGINEERING SUPPORT

POSITION TITLE/OCCUPATION	GOVERNMENT PRICE LIST Hourly Rate per Mod AO03 Effective January 16, 2004	
	<i>Off-site</i>	<i>On-site</i>
Principal	130.87	104.70
Program Manager	103.57	104.70
Data Management Specialist	69.72	75.52
Engineer I	43.68	37.13
Engineer II	55.53	47.21
Engineer III	64.92	55.19
Engineer IV	77.14	65.56
Engineer V	89.44	76.02
Engineer VI	99.03	84.18
Engineer VII	112.94	96.00
Engineer VIII	123.84	105.25
Drafter/CAD Specialist I	33.03	28.07
Drafter/CAD Specialist II	45.68	38.83
Drafter/CAD Specialist III	55.34	47.04
Drafter/CAD Specialist IV	60.51	51.44
Engineering Technician I	32.61	27.71
Engineering Technician II	38.53	32.91
Engineering Technician III	52.13	44.31
Engineering Technician IV	54.92	46.68
Engineering Technician V	61.18	52.00
Engineering Technician VI	67.00	56.96
Word Processor I	36.69	31.18
Word Processor II	42.08	35.77
Word Processor III	48.82	41.25

DESCRIPTION OF POSITION TITLE/OCCUPATION

Senior Program Manager

General Characteristics: Must have a minimum of ten (15) years experience in managing electrical power systems programs of varying complexities. Experience in complete engineering project development from inception to deployment, with a demonstrated ability to provide guidance and direction on tasks similar to those to be performed. Proven expertise in the management and control of funds and resources. Demonstrated capability in the overall management of multi-task contracts of type and /or complexity of contract to be performed.

Typical Duties and Responsibilities. Serves as contract manager, and the authorized point of contact with the government contracting officer and the COTR. Interfaces with government management personnel, contract managers, and customer agency representatives. Responsible for formulating and enforcing work standards, assigning contractor schedules, reviewing work quality, communicating policies, purposes, and goals of the organization to subordinates.

Program Manager

General Characteristics: Must have a minimum of ten (10) years experience in managing electrical power systems programs of varying complexities. Experience in complete engineering project development from inception to deployment, with a demonstrated ability to provide guidance and direction on tasks similar to those to be performed. Proven expertise in the management and control of funds and resources. Demonstrated capability in the overall management of multi-task contracts of type and /or complexity of contract to be performed.

Typical Duties and Responsibilities. Serves as contract manager, and the authorized point of contact with the government contracting officer and the COTR. Interfaces with government management personnel, contract managers, and customer agency representatives. Responsible for formulating and enforcing work standards, assigning contractor schedules, reviewing work quality, communicating policies, purposes, and goals of the organization to subordinates.

Data Management Specialist

Applies communication expertise and project management skills to the coordination of large power equipment acquisitions, as well as the scheduling and tracking of system installation and integration activities at highly visible and politically sensitive air traffic control facilities across the nation. Negotiates with other Federal program offices and service providers on all deliverables and special order requirements. Routinely brief product team representatives on project status, funding requirements, risks, and accomplishments. Facilitates interface between stakeholders and assists in conflict resolution on a day-to-day basis. Expertise includes, but is not limited to MS Access, Visio, MS Word, MS Excel, MS Project, MS Power Point, DataEase.

Engineer I

General characteristics: At this beginning professional level, performs assignments designed to develop professional work knowledge and abilities. May also receive formal classroom or seminar-type training. (Terminal positions are excluded.)

Direction received. Works under close supervision. Receives specific and detailed instructions as to required tasks and results expected. Work is checked during progress and is reviewed for accuracy upon completion.

Typical duties and responsibilities: Performs a variety of routine tasks that are planned to provide experience and familiarization with the engineering staff, methods, practices, and programs of the employer.

Responsibility for the direction of others. Usually none.

Engineer II

General characteristics. Performs routine engineering work requiring application of standard techniques, procedures, and criteria in carrying out a sequence of related engineering tasks. Limited exercise of judgment is required on details of work and in making preliminary selections and adaptations of engineering alternatives. Requires work experiences acquired in an entry-level position, or appropriate graduate level study. For training and developmental purposes, assignments may include some work that is typical of a higher level.

Direction received. Supervisor screens assignments for unusual or difficult problems and selects techniques and procedures to be applied on non-routine work. Receives close supervision on new aspects of assignments.

Typical duties and responsibilities. Using prescribed methods, performs specific and limited portions of a broader assignment of an experienced engineer. Applies standard practices and techniques in specific situations, adjusts and correlates data, recognizes discrepancies in results, and follows operations through a series of related detailed steps or processes.

Responsibility for the direction of others. May be assisted by a few aids or technicians.

Engineer III

General characteristics. Independently evaluates, selects, and applies standards engineering techniques, procedures, and criteria, using judgment in making minor adaptations and modifications. Assignments have clear and specified objectives and require the investigation of a limited number of variables. Performance at this level requires developmental experience in a professional position, or equivalent graduate level education.

Direction received. Receives instructions on specific assignment objectives, complex features, and possible solutions. Assistance is furnished on unusual problems and work is reviewed for application of sound professional judgment.

Typical duties and responsibilities. Performs work which involves conventional types of plans, investigations, surveys, structures, or equipment with relatively few complex features for which there are precedents. Assignments usually include one or more of the following: equipment design and development, test of materials, preparation of specifications, process study, research investigations, report preparation, and other activities of limited scope requiring knowledge of principles and techniques commonly employed in the specific narrow area of assignments.

Responsibility for the direction of others. May supervise or coordinate the work of drafters, technicians, and others who assist in specific assignments.

Engineer IV

General characteristics. As a fully competent in all conventional aspects of the subject matter or the functional area of the assignments, plans and conducts work requiring judgment in the independent evaluation, selection, and substantial adaptation and modification of standard techniques, procedures, and criteria. Devises new approaches to problems encountered. Requires sufficient professional experience to assure competence as a fully trained worker; or, for positions primarily of a research nature, completion of all requirements for a doctoral degree may be substituted for experience.

Direction received. Independently performs most assignments with instructions as to the general results expected. Receives technical guidance on unusual or complex problems and supervisory approval on proposed plans for projects.

Typical duties and responsibilities. Plans, schedules, conducts or coordinates detailed phases of the engineering work in a part of a major project or in a total project of moderate scope. Performs work, which involves conventional engineering practice but may include a variety of complex features such as conflicting design requirements, unsuitability of standard materials, and difficult coordination requirements. Work requires a

broad knowledge of precedents in the specialty area and a good knowledge of principles and practices of related specialties.

Responsibility for the direction of others. May supervise a few engineers or technicians on assigned work.

Engineer V

General characteristics. Applies intensive and diversified knowledge of engineering principles and practices in broad areas of assignments and related fields. Makes decisions independently on engineering problems and methods and represents the organization in conferences to resolve important questions and to plan and coordinate work. Requires the use of advanced techniques and the modification and extension of theories, precepts, and practices of the field and related sciences and disciplines. The knowledge and expertise required for this level of work usually result from progressive experience, including work comparable to engineer IV.

Direction received. Supervision and guidance relate largely to overall objectives, critical issues, new concepts, and policy matters. Consults with supervisor concerning unusual problems and developments.

Typical duties and responsibilities include one or more of the following: In a supervisory capacity, plans, develops, coordinates, and directs a large and important engineering project or a number of small projects with many complex features. A substantial portion of the work supervised is comparable to that described for engineer IV.

As individual researcher or worker, carries out complex or novel assignments requiring the development of new or improved techniques and procedures. Work is expected to result in the development of new or refined equipment, materials, processes, products and/or scientific methods.

As staff specialist, develops and evaluates plans and criteria for a variety of projects and activities to be carried out by others. Assesses the feasibility and soundness of proposed engineering evaluation tests, products, or equipment when necessary data are insufficient or confirmation by testing is advisable. Usually performs as a staff advisor and consultant in a technical specialty, a type of facility or equipment, or a program function.

Responsibility for the direction of others. Supervises, coordinates, and reviews the work of a small staff of engineers and technicians; estimates personnel needs and schedules and assigns work to meet completion date. Or, as individual researcher or staff specialist, may be assisted on projects by other engineers or technicians.

Engineer VI

General characteristics. Has full technical responsibility for interpreting, organizing, executing, and coordinating assignments. Plans and develops engineering projects major programs. This involves exploration of subject area, definition of scope and selection of problems for investigation, and development of novel concepts and approaches. Maintains liaison with individuals and units within or outside the organization with responsibility for acting independently on technical matters pertaining to the field. Work at this level usually requires extensive progressive experience including work comparable to engineer V.

Direction received. Supervision received is essentially administrative, with assignments given in terms of broad general objectives and limits.

Typical duties and responsibilities include one or more of the following:

In a supervisory capacity, a) plans, develops, coordinates, and directs a number of large and important projects or a project of major scope and importance, or b) is responsible for the entire engineering program of a company or government agency when the program is of limited complexity and scope. Extent of responsibilities generally requires a few (3 to 5) subordinate supervisors or team leaders with at least one in a position comparable to level V.

As individual researcher or worker, conceives, plans, and conducts research in problem areas of considerable scope and complexity. The problems must be approached through a series of complete and conceptually related studies, are difficult to define, require unconventional or novel approaches, and require sophisticated

research techniques. Available guides and precedents contain critical gaps, are only partially related to the problem, or may be largely lacking due to the novel character of the project. At this level, the individual researcher generally will have contributed inventions, new designs, or techniques which are of material significance in the solution of important problems.

As a staff specialist, serves as the technical specialist for the organization in the application of advanced theories, concepts, principles, and processes for an assigned area of responsibility (i.e., subject matter, function, type of facility, or equipment, or product).

Keep abreast of new scientific methods and developments affecting the organization for the purpose of recommending changes in emphasis of programs or new programs warranted by such developments.

Responsibility for the direction of others. Plans, organizes, and supervises the work of a staff of engineers and technicians. Evaluates progress of the staff and results obtained, and recommends major changes to achieve overall objectives. Or, as individual researcher or staff specialist, may be assisted on individual projects by other engineers or technicians.

Engineer VII

General characteristics. Makes decisions and recommendations that are recognized as authoritative and have an important impact on extensive engineering activities. Initiates and maintains extensive contacts with key engineers and officials of other organizations, requiring skill in persuasion and negotiation of critical issues. At this level, individuals will have demonstrated creativity, foresight, and mature engineering judgment in anticipating and solving unprecedented engineering problems, determining program objectives and requirements, organizing programs and projects, and developing standards and guides for diverse engineering activities.

Direction received. Receives general administrative direction.

Typical duties and responsibilities include one or both of the following:

In a supervisory capacity, is responsible for a) an important segment of the engineering program of a company or government agency with extensive and diversified engineering requirements, or b) the entire engineering program of a company or agency when it is more limited in scope. The overall engineering program contains critical problems the solution of which requires major technological advances and opens the way for extensive related development. Extent of responsibilities generally requires several subordinate organizational segments or teams. Recommends facilities, personnel, and funds required to carry out programs which are directly related to and directed toward fulfillment of overall objectives.

As individual researcher and consultant, is a recognized leader and authority in the company or government agency in a broad area of specialization or in a narrow but intensely specialized field. Selects research problems to further program objectives. Conceives and plans investigations of broad areas of considerable novelty and importance, for which engineering precedents are lacking in areas critical to the overall engineering program. Is consulted extensively by associates and others, with a high degree of reliance placed on incumbent's scientific interpretations and advice. Typically, will have contributed inventions, new designs, or techniques which are regarded as major advances in the field.

Responsibility for the direction of others. Directs several subordinate supervisors or team leaders, some of who are comparable to engineer VI; or as individual researcher and consultant, may be assisted on individual projects by other engineers and technicians.

Engineer VIII

General characteristics. Makes decisions and recommendations that are recognized as authoritative and have a far-reaching impact on extensive engineering and related activities of the company or government agency. Negotiates critical and controversial issues with top level engineers and officers of other organizations. Individuals at this level demonstrates a high degree of creativity, foresight, and mature judgment in planning, organizing, and guiding extensive engineering programs and activities of outstanding novelty and importance.

Direction received. Receives general administrative direction.

Typical duties and responsibilities include one or both of the following:

In a supervisory capacity, is responsible for a) an important segment of a very extensive and highly diversified engineering program of a company or government agency, or b) the entire engineering program of a company or agency when the program is of moderate scope. The programs are of such complexity and scope that they are of critical importance to overall objectives, include problems of extraordinary difficulty that often have resisted solution, and consist of several segments requiring subordinate supervisors. Decides the kind and extent of engineering and related programs needed to accomplish the objectives of the company or agency, chooses scientific approaches, plans and organizes facilities and programs, and interprets results.

As individual researcher and consultant, formulates and guides the attack on problems of exceptional difficulty and marked importance to the company, industry and government. Problems are characterized by their lack of scientific precedents and source material, or lack of success of prior research and analysis so that their solution would represent an advance of great significance and importance. Performs advisory and consulting work as a recognized authority for broad program areas or in an intensely specialized area of considerable novelty and importance.

Responsibility for the direction of others. Supervises several subordinate supervisors or team leaders, some of whose positions are comparable to engineer VII, or individual researchers some of whose positions are comparable to engineer VII and sometimes engineer VIII. As an individual researcher and consultant may be assisted on individual projects by other engineers or technicians.

Note: Individuals in charge of an engineering program may match any of several of the survey job levels, depending on the program's size and complexity. Excluded from the definition are: 1) engineers in charge of programs so extensive and complex (e.g., consisting of research and development on a variety of complex products or systems with numerous performing at level VIII; 2) individuals whose decisions have direct and substantial effect on setting policy for the organization (included, however, are supervisors deciding the "kind and extent of engineering and related programs" within broad guidelines set at higher levels); and 3) individual researchers and consultants who are recognized as national and/or international authorities and scientific leaders in very broad areas of scientific interest and investigation.

Drafter I/CAD Specialist I

Prepares drawings of simple, easily visualized structures, systems, parts or equipment from sketches or marked-up prints. Selects appropriate templates or uses a compass and other equipment needed to complete assignments. Drawings fit familiar patterns and present few technical problems. Supervisor provides detailed instructions on new assignments, gives guidance when questions arise, and reviews completed work for accuracy. Typical assignments include:

From marked-up prints, revises the original drawings of a plumbing system by increasing pipe diameters.

From sketches, draws building floor plans, determining size, spacing, and arrangement of freehand lettering according to scale.

Draws simple land profiles from predetermined structural dimensions and reduced survey notes. Traces river basin maps and enters symbols to denote stream sampling locations, municipal and industrial waste discharges, and water supplies.

Drafter II/CAD Specialist II

Prepares various drawings of such units as construction projects or parts and assemblies, including various views, sectional profiles, irregular or reverse curves, hidden lines, and small or intricate details. Work requires use of most of the conventional drafting techniques and a working knowledge of the terms and procedures of the occupation. Makes arithmetic computations using standard formulas. Familiar or recurring work is assigned in general terms. Unfamiliar assignments include information on methods, procedures, sources of information, and precedents to follow. Simple revisions to existing drawings may be assigned with a verbal explanation of the desired results. More complex revisions are produced from sketches or specifications which clearly depict the desired product. Typical assignments include:

From a layout and manual references, prepares several views of a simple gear system. Obtains dimensions and tolerances from manuals and by measuring the layout.

Draws base and elevation views, sections, and details of new bridges or other structures; revises complete sets of roadway drawings for highway construction projects; or prepares block maps, indicating water and sewage line locations.

Prepares and revises detail and design drawings for such projects as the construction and installation of electrical or electronic equipment, plant wiring, and

the manufacture and assembly of printed circuit boards. Drawings typically include details of mountings, frames, guards, or other accessories; conduit layouts; or wiring diagrams indicating transformer sizes, conduit locations and mountings.

Drafter III/CAD Specialist III

Prepares complete sets of complex drawings which include multiple views, detail drawings, and assembly drawings. Drawings include complex design features that require considerable drafting skill to visualize and portray. Assignments regularly require the use of mathematical formulas to draw land contours or to compute weights, center of gravity, load capacities, dimensions, quantities of material, etc. Works from sketches, models, and verbal information supplied by an engineer, architect, or designer to determine the most appropriate views, detail drawings, and supplementary information needed to complete assignments. Selects required information from precedents, manufacturers' catalogs, and technical guides. Independently resolves most of the problems encountered. Supervisor or design originator may suggest methods of approach or provide advice on unusually difficult problems. Typical assignments include:

From layouts or sketches, prepares complete sets of drawings of test equipment to be manufactured. Several cross-sectional and subassembly drawings are required. From information supplied by the design originator and from technical handbooks and manuals, describes dimensions, tolerances, fits, fabrication techniques, and standard parts to use in manufacturing the equipment.

From electronic schematics, information as to maximum size, and manuals giving dimensions of standard parts, determines the arrangement and prepares drawings of printed circuit boards.

From precedents, drafting standards, and established practices, prepares final construction drawings for floodgates, navigation locks, dams, bridges, culverts, levees, channel excavations, dikes, and berms; prepares boring profiles, typical cross-sections, and land profiles; and delineates related topographical details as required.

Prepares final drawings for street paving and widening or for water and sewer lines having complex trunk lines; reduces field notes and calculates true grades. From engineering designs, lays out plan, profile and detail appurtenances required; notifies supervisor of conflicting details in design.

Note: *Excludes* drafters performing work of similar difficulty to that described at this level but who provide support for a variety of organizations which have widely differing functions or requirements.

Drafter IV/CAD Specialist IV

Works closely with design originators, prepares drawings of *unusual, complex, or original designs which require a high degree of precision*. Performs unusually difficult assignments requiring considerable initiative, resourcefulness, and drafting expertise. Assures that anticipated problems in manufacture, assembly, installation, and operation are resolved by the drawings produced. Exercises independent judgment in selecting and interpreting data based on a knowledge of the design intent. Although working primarily as a drafter, may occasionally interpret general designs prepared by others to complete minor details. May provide advice and guidance to lower level drafters or serve as coordinator and planner for large and complex drafting projects.

Engineering Technician I

Performs simple routine tasks under close supervision or from detailed procedures. Work is checked in progress or on completion. Performs one or a combination of such typical duties as:

Assembles or installs equipment or parts requiring simple wiring, soldering, or connecting.

Performs simple or routine tasks or tests such as tensile or hardness tests; operates and adjusts simple test equipment; records test data.

Gathers and maintains specified records of engineering data such as tests, drawings, etc.; performs computations by substituting numbers in specified formulas; plots data and draws simple curves and graphs.

Engineering Technician II

Performs standardized or prescribed assignments involving a sequence of related operations. Follows standard work methods on recurring assignments but receives explicit instructions on unfamiliar assignments. May become familiar with the operation and design of equipment and with maintenance procedures and standards. Technical adequacy of routine work is reviewed on completion; nonroutine work may also be reviewed in progress. Performs at this level one or a combination of such typical duties as:

Following specific instructions, assembles or constructs simple or standard equipment or parts; may service or repair simple instruments or equipment;

Conducts a variety of tests using established methods. Prepares test specimens, adjusts and operates equipment, and records test data, pointing out deviations resulting from equipment malfunction or observational error.

Extracts engineering data from various prescribed but nonstandardized sources; processes the data following well-defined methods including elementary algebra and geometry; presents the data in prescribed form.

Engineering Technician III

Performs assignments that are not completely standardized or prescribed. Selects or adapts standard procedures or equipment, using precedents that are not fully applicable. Receives initial instruction, equipment requirements, and advice from supervisor or engineer as needed; performs recurring work independently; work is reviewed for technical adequacy or conformity with instructions. Performs at this level one or a combination of such typical duties as:

Constructs components, subunits, or simple models and adapts standard equipment. May troubleshoot and correct malfunctions requiring simple solutions.

Follows specific layout and scientific diagrams to construct and package simple devices and subunits of equipment.

Conducts various tests or experiments which may require minor modifications in test setups or procedures as well as subjective judgments in measurement; selects, sets up, and operates standard test equipment and records test data.

Extracts and compiles a variety of engineering data from field notes, manuals, lab reports, etc.; processes data, identifying errors or inconsistencies; selects methods of data presentation.

Assists in design modification by compiling data related to designs, specifications, and materials which are pertinent to specific items of equipment or component parts. Develops information concerning previous operational failures and modifications. Uses judgment and initiative to recognize inconsistencies or gaps in data and seek sources to clarify information.

Engineering Technician IV

Performs nonroutine assignments of substantial variety and complexity, using operational precedents which are not fully applicable. Such assignments, which are typically parts of broader assignments, are screened to eliminate unusual design problems. May also plan such assignments. Receives technical advice from supervisor or engineer; work is reviewed for technical adequacy (or conformity with instructions). May be assisted by lower level technicians and have frequent contact with professionals and others within the establishment. Performs at this level one or a combination of such typical duties as:

Develops or reviews designs by extracting and analyzing a variety of engineering data. Applies conventional engineering practices to develop, prepare, or recommend schematics, designs, specifications, electrical drawings, and parts lists. Examples of designs include: detailed circuit diagrams; hardware fittings or test equipment involving a variety of mechanisms; conventional piping systems; and building site layouts.

Conducts tests or experiments requiring selection and adaptation or modification of a wide variety of critical test equipment and test procedures; sets up and operates equipment; records data, measures and records problems of significant complexity that sometimes require resolution at a higher level; and analyzes data and prepares test reports.

Applies methods outlined by others to limited segments of research and development projects; constructs experimental or prototype models to meet engineering requirements; conduct tests or experiments and redesigns as necessary; and records and evaluates data and report findings.

Engineering Technician V

Performs nonroutine and complex assignments involving responsibility for planning and conducting a complete project of relatively limited scope or a portion of a larger and more diverse project. Selects and adapts plans, techniques, designs, or layouts. Contacts personnel in related activities to resolve problems and coordinate the work; reviews, analyzes, and integrates the technical work of others. Supervisor or professional engineer outlines objectives, requirements, and design approaches; completed work is reviewed for technical adequacy and satisfaction of requirements. May train and be assisted by lower level technicians. Performs at this level one or a combination of such typical duties as:

Designs, develops, and constructs major units, devices or equipment; conducts tests or experiments; analyzes results and redesigns or modifies equipment to improve performance; and reports results.

From general guidelines and specifications (e.g., size or weight requirements), develops designs for equipment without critical performance requirements which are difficult to satisfy such as engine parts, research instruments, or special purpose circuitry. Analyzes technical data to determine applicability to design problems; selects from several possible design layouts; calculates design data; and prepares layouts, detailed specifications, parts lists, estimates, procedures, etc. May check and analyze drawings or equipment to determine adequacy of drawings and design.

Plans or assists in planning tests to evaluate equipment performance. Determines test requirements, equipment modification, and test procedures; conducts tests using all types of instruments, analyzes and evaluates tests results, and prepares reports on findings and recommendations.

Engineering Technician VI

Independently plans and accomplishes complete projects or studies of broad scope and complexity. Or serves as an expert in a narrow aspect of a particular field of engineering, e.g., environmental factors affecting electronic engineering. Complexity of assignments typically requires considerable creativity and judgment to devise approaches to accomplish work, resolve design and operational problems, and make decisions in situations where standard engineering methods, procedures, and techniques may not be applicable. Supervisor or professional engineer provides advice on unusual or controversial problems or policy matters; completed work is reviewed for compliance with overall project objectives. May supervise or train and be assisted by lower level technicians. Performs, at this level, one or a combination of such typical duties as:

Prepares designs and specifications for various complex equipment or systems (e.g., a heating system in an office building, or new electronic components such as solid state devices for instrumentation equipment). Plans approach to solve design problems; conceives and recommends new design techniques; resolves design problems with contract personnel, and assures compatibility of design with other parts of the system.

Designs and coordinates test set ups and experiments to prove or disprove the feasibility of preliminary design; uses untried and untested measurement techniques; and improves the performance of the equipment. May advise equipment users on redesign to solve unique operational deficiencies.

Plans approach and conducts various experiments to develop equipment or systems characterized by (a) difficult performance requirements because of conflicting attributes such as versatility, size, and ease of operation; or (b) unusual combination of techniques or components. Arranges for fabrication of pilot models and determines test procedures and design of special test equipment

Word Processor I

Produces a variety of standard documents, such as correspondence, form letters, reports, tables and other printed materials. Work requires skill in typing; a knowledge of grammar, punctuation, and spelling; and ability to use reference guides and equipment manuals. Performs familiar, routine assignments, following standard procedures. Seeks further instruction for assignments requiring deviations from established procedures.

Word Processor II

Uses a knowledge of varied and advanced functions of one software type, a knowledge of varied functions of different types of software, or a knowledge of specialized or technical terminology to perform such typical duties as:

Editing and reformatting written or electronic drafts. Examples include: Correcting function codes; adjusting spacing and formatting; and standardizing headings, margins, and indentations.

Transcribing scientific reports, lab analyses, legal proceedings, or similar material from voice tapes or handwritten drafts. Work requires knowledge of specialized, technical, or scientific terminology.

Work requires familiarity with office terminology and practices, incumbent corrects copy and questions originator of document concerning missing information, improper formatting or discrepancies in instructions. Supervisor sets priorities and deadlines on continuing assignments, furnishes general instructions for recurring work, and provides specific instructions for new or unique projects. May lead lower level word processors.

Word Processor III

Requires both a comprehensive knowledge of word processing software applications and office practices and a high degree of skill in applying software functions to prepare complex and detailed documents. For example, processes complex and lengthy technical reports which include tables, graphs, charts, or multiple columns. Uses either different word processing packages or many different style macros or special command functions. Independently completes assignments and resolves problems.